

## SUMMARY AND RECOMMENDATIONS

*Bocconia* was present within three infestation areas of the Island of Hawai'i: Wood Valley, Honomolino and Manukā. *Bocconia* was distributed across 1,638 ha. Elevational ranges of the infestations were from 350 to 1,005 m. Both of these elevational extremes were recorded at Wood Valley. The most severe infestations were observed within young (5-10 m in height) *Eucalyptus* plantations in Wood Valley. Lower population densities were observed in mature alien forests. *Bocconia* was more abundant in forest canopy gaps, roadsides and streambeds than in adjacent undisturbed areas, thus an affinity for high light levels and soil disturbance is suspected. Cane lands harbored mature *Bocconia* at much lower densities than *Eucalyptus* plantations (less than 100 individuals/ha versus greater than 500 individuals/ha). Disturbance of infested cane lands can be expected to favor a flush of this fast growing species. *Bocconia* was generally not observed in native, closed-canopy `ōhi`a and koa forests. *Bocconia* infestations within gulches oceanward of Highway 11 are the greatest threat to managed native plant communities in HAVO due to their proximity and dispersal mechanisms. Native forest and open shrubland harbored relatively low plant densities in the Manukā and Honomolino sites. *Bocconia* is most abundant along roadsides, rangelands and residential areas in the south Kona district.

Based on distribution data from Maui, where *Bocconia* infests leeward environments between 152-1768 m (Starr et al. 2003), suitable habitat exists for *Bocconia* to expand its range on the Island of Hawai'i.

### Wood Valley Recommendations

We recommend containment for Wood Valley with the following specifications:

- Eradicate outlying populations to contain *Bocconia*. Nineteen outlying populations in Wood Valley contain an estimated 305 plants, and control is feasible because the sites are accessible. Since most outliers were mapped from a helicopter, some populations may have escaped detection, thus control work along the population's perimeter would also identify overlooked individuals.
- Eradicate *Bocconia* in oceanward gulches. All gulches on the ocean side of Highway 11 containing *Bocconia* should be controlled, and all gulches that pass through the infestation area should be swept and controlled between 152 and 420 m elevation. This strategy will limit *Bocconia* spread in lower elevations.
- Control *Bocconia* in Wood Valley Township. Private landowners and volunteer groups could reasonably control *Bocconia* across much of its range in Wood Valley. Additional support could come from local, state and federal government sources.
- Monitor *Eucalyptus* plantations. The core *Eucalyptus* populations should be left untreated, as control work is likely prohibitively expensive in areas with high infestation rates. Monitoring will provide valuable information regarding the fate of this weed as the surrounding timber matures.
- Implement an aerial monitoring program. This will prevent *Bocconia* from expanding its range by providing location data for outlying individuals.

Monitoring should include the areas between the gulches on the ocean side of Highway 11 and the western boundary of Hawai'i Volcanoes National Park. The western edge of Wood Valley should also be included.

- Implement decontamination protocols. Proper decontamination of heavy machinery used in Wood Valley should prevent the transport of seeds to new areas. Soil movement from infested areas should also be discouraged, by posting signs near the infested areas and notifying contractors and landowners of the threats posed by soil contaminated with *Bocconia* seeds.

### **Manukā Recommendations**

We recommend eradication for the Manukā populations with the following specifications:

- Eradication of *Bocconia* in infested area. Control is feasible and, if resources permit, the infested area should be swept by ground crews at 1-2 year intervals. Eradication will prevent the potential spread of *Bocconia* and invasion of neighboring native plant communities.
- Implement an aerial monitoring program. *Bocconia* is easily detectable at this site, and aerial monitoring is a cost effective means to detect new outliers and assess the effectiveness of control.

### **Honomolino Recommendations**

We recommend eradication for the Honomolino area with the following specifications:

- Notify private landowners. Landowners (residential and agricultural) whose parcels contain *Bocconia* should be contacted, and control work should be initiated. The three identified clusters should be eradicated. Previous sites where *Bocconia* was observed should be revisited annually, to prevent additional establishment.
- Implement an aerial monitoring program. This will prevent *Bocconia* from expanding its range by detecting new outliers.